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# INAUGURAL ADDRESS,

DELIVERED AT A MEETING

OF

# THE MEDICO-BOTANICAL SOCIETY

OF

# LONDON,

HELD FEBRUARY 16TH, 1831,

PHILIP HENRY EARL STANHOPE, PRESIDENT, IN THE CHAIR.

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BY GILBERT T. BURNETT,

PROFESSOR OF BOTANY TO THE SOCIETY, AND LECTURER IN THE SCHOOL
OF PHYSIC, ST. GEORGE'S HOSPITAL, &C. &C.

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# INAUGURAL ADDRESS,

*&c. &c. &c.*

MY LORD PRESIDENT, AND GENTLEMEN:

As circumstances vary the relations in which men stand, the duties are varied they are destined to perform. Each step advanced, each height attained, as it expands their influence, in an equal degree extends their care. Posts of honour are not posts of ease, but are regarded in their truest light when they are viewed as stations of responsibility; and before attempting to fulfil the duties of such stations, all, who sincerely desire to discharge them with credit and profit to themselves and others, should endeavour clearly to understand their nature, and to become fully impressed with their importance. Since, therefore, being called to this honourable chair, I have laboured (not wholly, it is hoped, with fruitless effort,) to inform myself as to what must be required of the Professor of Botany to the Medico-Botanical Society; an office of no mean rank, in a Society of no mean importance: a Society, the bare mention of whose objects must immediately challenge our attention and regard, directed, as its exertions are, to the philosophic investigation of the distinctive characters and medicinal properties of plants; a knowledge by which, when fully gained, the power of physic will be much increased, and pain disarmed of half its terrors, by which *(Deo volente!)* the life of man may be much prolonged, and human misery may much be lessened.

As the avowed objects for which this Society was instituted, and the laws by which the Council govern, alike preclude all dissertations on purely botanical researches, topics upon which a botanic mind luxuriates; points upon which it loves to expatiate; of course, all comments on the laws of life affecting the development of the vegetable structure; all remarks on the wonderful metamorphoses, both regular and irregular, transitional and vicarious, which plants continually pass through; all disquisitions on the vital functions of these simplest organic beings; the assimilation of their food; the production of their peculiar principles; the reproduction of their species; their irritability; their seeming instincts; with many, many other curious and interesting physiological themes, though pregnant with information and replete with wonder, are all alike forbidden here. Botany being, to the Medico-Botanical Society, but one among several means by which it proposes to advance an ulterior object; hence, I must confess that my favorite study must not be allowed undue preponderance, and I submit to the decision, that, although a *means,* it is not *here* an *end;* it is one way to the science here held in view, (and a delightful flowery path it is,) but that it must not be mistaken for the goal itself.

Therefore, as these favorite topics would be here irrelevant, to a not less important, though less entrancing section must our attention at this present be directed, to one subdivision of one section of this extensive science, viz. Economic Botany; whence I shall be led to discuss the uses and properties of vegetables, more especially of medicinal plants, and medicinal preparations. Hence, in order not to wander from my province, and hoping to be set right by the Council if I greatly err, is it that I have resolved, in this my inaugural address, to trace, as it were in outline, the progress of medico-botanical science; for thus will be most clearly seen, not only the benefits it has bestowed upon mankind,—for thus will be most certainly foreshown, not only the blessings it has still in store, but also, from this conspectus of what has been already done, we shall be directed to what there remains for us to do: directed to that course which may most advantageously be pursued, and encouraged in those researches by which, in conjunction with his colleagues, the professor of botany may hope most efficiently to serve the ends, most rapidly to advance the objects, of your Society: for he feels, acutely feels, that, as an office is honourable, so, in an equal degree, does responsibility attach to him that holds it.

Gentlemen: As long as the human race have been subject to disease, as long as pain has been an evil, so long must means of alleviation have been sought, and so long must medicines have been prescribed and used. Rude, indeed, were the early essays of our art, and long must they have continued rude: the morning twilight of physic has been for ages dawning into perfect day; comparatively, it is not long since men, ignorant alike of the indications to be observed, and of the instruments by which those indications might be fulfilled, prescribed scarlet clothes for fever, because they both were red, and saffron for jaundice, on account of its yellow hue.

Much lately has been done in the investigation of diseases, their causes, their symptoms, and their effects; pathological anatomy has revealed many of the changes which various structures undergo, some of which morbid conditions impair the energies, and others are incompatible with the duration of life. But what avails it that the physician can trace by symptoms the successive stages of disorganization, as they proceed in structures concealed from view? what avails it that the surgeon can proclaim the appearance of such morbid alterations long before dissection unfolds them to the light? what avails it that both can foretell the impairment or destruction of vital parts, without they can at the same time learn to check the ravages of disease, and either to alleviate the sufferings of the patient or to afford him a perfect cure? Without such an application of this art, the means of obtaining it would to many be repulsive, and the science itself not a blessing, but a bane; as the foreknowledge of ills that could not be relieved would but aggravate the misery man is called on to endure. But such is not the opprobrium of our useful, and hence noble arts; for the theory of physic is founded on experience, and the benefits of its practice who can venture to deny! As sciences, medicine and surgery find few their equals; and as arts they are excelled by none.

Much, I repeat, has been lately done to advance our knowledge of disease, and something, though much less, to perfect our instruments of cure. These, however, are sister sciences, or rather their connexion is of a still closer kind: they are twins, which, as they are naturally, so for ever they should remain inseparably conjoined; and for the Medico-Botanical Society, whose attention is especially directed to this point, has the grateful task been left of perfecting this union: on it devolves the duty of steadying the arm of science, and placing surer weapons in her hands; i. e. of providing for physic new and more certain remedial means.

A circumstance which still shrouds medicine in mystery, must have been formerly much more perplexing than we find it now. Even, however, in the present day, it frequently involves the principles of our practice in obscurity; and hence some persons, ignorant of how many cases there are in which it approaches demonstration, have not scrupled to call physic a conjectural science; to define its object to be the calculation of chances, and its decision the balance of probabilities. I, of course, allude to the acknowledged difficulty of determining how far a cure should be attributed to the renovating powers of life, and how far to the remedial agents which art employs: for some diseases, and especially in some constitutions, will disappear not only without, but even in spite of the physician; whilst others, in other persons, or even in the same person at other times, not the most consummate skill can cure. Of this, the records of legitimate practice would afford us abundant illustrations; but the empirical artifices of the present day form still more familiar examples: to these I shall not particularly allude: some will *long* be notorious beacons.

From these sources of error, many useless, many nauseous, and not a few noxious, agents have, from time to time, been introduced, several of which have enjoyed an ill-earned fame; while some really efficient medicines have as undeservedly fallen into disrepute. Hence, likewise, can we account for many of those superstitious rites, anciently so mixed up with medicine as to have been esteemed an essential part thereof. Few persons will take the trouble of distinguishing the *post* from the *propter*; and, even to those who would, the power is oft-times wanting. A mind, patient in observation, and well disciplined to distinguish truth from error, does not commonly coexist with that instinct (shall I call it almost blind instinct,) for generalization, by which theories are planned, and systems raised. Allow an example to illustrate this abstract proposition.

Achilles, writes the poet, escaped unhurt, though long exposed to all a warrior's danger, (and so did others of the Grecian force, and so do many others in every hostile meeting;) Achilles at last was slain by an arrow which transfixed his heel, (and so have many others fallen by wounds in some especial parts, whether in the head, the hand, the heel, for weapons to each victim are not omnipresent;) but Achilles had been bathed by Thetis, (and so by most parents have their sons been washed;) yet it is fabled that the heel by which his mother held him was the only part unwetted; that heel, it is said, was pierced; and hence arose the fame of the antivulneriferous waters of the Styx. "POST *ergo* PROPTER *balneum salus*."

Again, in times of general sickness, the Romans, with solemnity, elected a Dictator, for the especial purpose (and that alone) of driving a nail into the temple of Jupiter, and when afterwards the pestilence decreased, *post ergo propter malleum salus.*

Just as, at the present time, in countries where the plague prevails, an angel is believed to cast a drop of water on the earth, on the festival of St. John, after which day the plague is stayed, and to which the restoration of salubrity is attributed, rather than to the actual cause, viz. the great increase of heat that then ensues, and which is incompatible with its duration.

Again, honey was employed in ancient times, as still it is, as a useful application to relieve aphthous eruptions in the mouth and fauces; but then the relief obtained was attributed not immediately to the mean employed, but intermediately to an extraneous coincidence foreign to its nature, and only therewith fortuitously connected; i. e. the cure was ascribed by Soranus, who records a case in point, not to the honey, *as* honey, but to the accidental circumstance of *that* honey, which wrought the cure he mentions, having been procured from bees that had hived near Hippocrates' tomb.

Thus when men prescribed medicines, of the properties of which there was little known, for diseases, of the pathology of which they knew much less, it cannot be surprising that, although sometimes, *perchance*, they might assist recovery, more frequently they would do no good; and not uncommonly they would do much harm. Still, such was the perverseness of superstition, such the obtuseness of her votaries, that, whenever recovery ensued after the administration of any remedial means, were it either independent, or even in spite, of its effects, the cure was immediately attributed thereto; and when, as oftentimes occurred in cases of real disease, (although many slight or supposititious ailments would occasionally disappear during the exhibition,) it failed to cure or to relieve, some trifling variation in attendant circumstances, such as the mode or hour of administration or collection, or some such other trifling irregularity, not only foreign but impertinent to the question, was referred to as the source of failure: and hence arose many of those superstitious rites which figure so strangely in the medical records of antiquity. Thus, if, as we are told, the vervain cured the falling sickness in one individual, and in another failed; i. e. if *after* its administration one individual got better, and another worse, and if it was observed, or even fancied, that the latter had gathered the herb with his right hand, and the former with his left, this supposed ceremonial irregularity was esteemed a sufficient cause of failure; and hence arose the dogma that vervain should be gathered with the left hand only; but when, as could not but occur, of the left hand gatherers, some recovered and others died, further sources of disappointment were invented, and any thing was doubted rather than the potency of the plant *when charmed;* such as the time, the previous incantations, and other such like matters. But, in spite of all precautions, failures still ensued, and as fast as failures multiplied, so fast increased the ceremonials likewise, until at length we learn that the vervain was to be gathered with the left hand only, libations of honey being previously poured out, and after the plant had been encompassed with a circle: it was to be done likewise at the rising of the dog-star, and when neither the sun nor the moon shone. Again, the Selago was to be reverently approached with the feet bare, yet never to be touched with the naked hand. But, not to add instance to instance, for here the increase of examples is not required, the misťletoe, or all-health of the Druids, may be at once referred to, as a most remarkable and familiar illustration, and one, the particulars of which, without repetition, will be present to the memory of all.

When subsequently, as could not but occur, some refractory patients refused to take the nauseous doses which fraud and superstition had prescribed, and still, in spite of their presumption and irreverence, recovered, then the ceremonial observances of the friends or the attendants received the credit which had previously been given to the drug, and certain rites became esteemed as charms for the cure of persons sick, and for the preservation of those in health. Hence votive tablets and incantations sprang; in truth, a vast improvement in the art of physic; for, during these ritual observances, nature was allowed to effect a cure unimpeded by the interference of ignorant pretenders. The cure of wounds by sympathy forms of this a celebrated example; for thus the noxious dressings became applied to the weapon, instead of to the wound, which modest nature in the mean time healed; while incantations and sympathetic unguents gained the credit: to them, however, much praise was due, for the time they afforded to the *vis medicatrix* to effect a cure.

But were all the therapeutic agents, so famed in former times, utterly inefficient towards the recovery of health? Certainly not: far from it. But the principle of their administration was woefully misunderstood; and, consequently, the means themselves capriciously and often ineffectually applied. For who doubts the efficacy of hygeian springs, or the recovery of the sick who journey in quest of health to Hippocrates' tomb? Who doubts the history of strength restored to pious pilgrims, when abstinence and exercise (the sanative principles of the "*ball of basilisk*") were necessarily attendant on their visits to distant shrines. For one, I doubt not. I believe implicitly that many did not recover; that many were relieved; that many were restored to perfect health: just as I implicity believe a journey (call it, if you please, a pilgrimage,) to Cheltenham, to Harrowgate or Bath, to Madeira, the south of France or Italy, the change from a London to a country life, a necessity for exertion, more early hours, and often some slight abstinence in food, or a total change of diet, will even now, and in these degenerate days, do much towards checking the progress of disease, much towards the recovery of health. To be sure, the principles of the prescription are not similar, although both the agents and the patients are much the same. *Nomina* as well as *Tempora mutantur, sed nos* non *mutamur ab illis*."

We smile at the recital of the superstitions and credulity of a former age, and we do well: though we little think that our smiles too often condemn ourselves: for how little do we yet know of the nature of the instruments we frequently employ for the cure of disease, and how very little of the nature of disease itself. I say not this invidiously, for much in both departments has been lately done; but this increase of light only the more strongly shows how very much more there remains for us to do. Still this is a subject rather of congratulation than despair; it is rather our incitement than disgrace.

Experimental study, supplanting mere speculative philosophy, has worked miracles on every side; and in no science has it wrought more wonders than in our own. Experiment is the key by which we have been already able to translate so many passages from the book of nature into our mother tongue, and by which we hope to be enabled to construe many more. But because much has been lately done, therewith shall we rest content?—forbid the unworthy thought; for contentment too often is allied to sloth, and sloth is the bane of science. Our predecessors have been our pioneers; they have cleared away from the entrance to the temple of Truth much of the accumulated rust of ages. We now no longer hear of the royal touch being efficacious in the cure of scrofula; although once, in this very town, a philosopher (who lived, as we might say, before his age,) was tried, found guilty, and severely punished, for doubting the efficacy of this repellent. We no longer hear of those disgusting tales of females crowding to the gallows' foot, to have unsightly tumors rubbed with an executed felon's hand; and their necks, by the officiating hangman, smeared with perspiration wrung from a fellow-creature in the agonies of death. No longer are our Dispensatories disgraced by the enumeration of " manus regalis" et "manus hominis mortui" as remedial means. Yes: our Dispensatories have been much purified of late, and medicines no longer are prescribed merely because they are nauseous; nor things now given to a man when sick which would disorder his system even in the most perfect health. General observations are, however, tedious: let them be changed for an example. Among the much valued vegetable medicines of the century before the last, was mouldiness, or mildew: not simply mould, not that which springs on decaying wood, or bread, or meat, or cheese, but mouldiness scraped from a human skull. This drug even stands in the catalogue of materia medica published by the London Royal College of Physicians A. D. 1618, as " usnea cranii humani," which shows how much it was esteemed; for the College have ever striven, as far as the prejudices of the age would let, to discard all useless articles, and to march, though with discretion, not hardihood, in the van of science. Again, the urine and the excrement of various animals were formerly much esteemed: and of each we find extensive lists recommended officially to notice. Much of the supposed efficacy of drugs seems once to have been attributed to the filthiness of the sources whence they were derived: thus, although carbonate and phosphate of lime are excellent absorbent earths, and exhibited with much benefit in many cases of cardialgia, diarrhœa, and other complaints, still a simple chalk mixture would have been formerly despised; while one of *album græcum* would have been swallowed with avidity. Now album græcum, it is all but needless to observe, was only an impure bone earth, not obtained from the laboratory of the chemist, but elaborated in the intestines of the dog. For the preparation of this precious drug, dogs were purposely all but starved, well-picked bones being their only food; and then, the gelatine of the bones being partly absorbed during the passage of this osseous matter through the alimentary canal, the earthy portions were evacuated in a half-blanched and semi-pulverulent condition: this excrement was then collected with a jealous care, and became the album græcum of the shops, highly prized as a discutient, and forming a favorite internal application to the throat in quinzies. I will not waste your valuable time in further disquisitions on this subject, although it is a point of curious interest to trace the progress of the art we study, and highly useful sometimes to unravel the absurd intricacies of those who loved to make medicine a greater mystery than it ever will inevitably be; for thus do we in our minds enhance the estimation of that unsophisticated and simple nomenclature which signalizes the age, and with which science now in general is blessed: and we shall ever value more this striving after perspicuity, even if it fail, when we contemplate the obscurity in which all subjects were at one time purposely involved; *names* being given to *things* apparently rather to conceal than to explain their nature, although sometimes, as in the *aqua omnium florum*, there was an oracular latent witticism which fails not to provoke a smile; for, says BAILEY, "*aqua omnium florum*" means (among chemists) the distilled water of cows' dung, when cows go to grass. But of this enough: one sample of such precious balms may well suffice.

An imperfect knowledge of the essential properties of medicines, especially of the vegetable materia medica, has always led, as still it does, and as long as it exists must ever lead to complicate our prescriptions, to cripple our resources, and to confuse our principles of practice. Formerly this was much more prevalent than it can be now; but, even in the present age, I doubt not that great and unneeded complexity remains, though as yet it may be hidden from our eyes. Each succeeding year long has tended to simplify and curtail our catalogues of drugs; and each succeeding year, it may be easily foretold, will tend to simplify and curtail them more. I could point out many instances, both ancient and modern, in which agents, similar in effect, if not identical in composition, appear many times under different denominations, their names being the points in which they differ most. How many mere varieties of carbonate and phosphate of lime do we even now admit, merely because they are derived from different sources, and how much more numerous were they in the age before the last, when all drugs were considered essentially distinct whenever the substances were distinct from which they were obtained. I have chosen this purely chemical illustration because chemistry has lately thrown so much light on medicine, and promises to shed much more, and its researches are far more complete in the constitution of inorganic than of organic nature. Indeed, we are at present unable to determine, in the vegetable department, how far many of our most costly drugs may be entirely dispensed with, as many have already been. How many mere varieties of expensive astringents, bitters, aromatics, &c. do we not now employ, when more than a reasonable doubt may be entertained as to whether, as in the instance referred to, their truly efficient principles may not be extracted from cheaper materials and more abundant sources: of this we have already proved the practicability in several important cases. Thus, the vegetable alkali, our sub-carbonate of potash, was at one time possessed of numerous names, and appeared and re-appeared over and over again in the Dispensatory; and yet, at each repetition, seems to have been considered a new and independent drug. Thus, we find it introduced under the style and titles of Sal Absinthii, or salt of wormwood, Centaurii minoris, Cichorii, Euphrasiæ, Fabarum, Fumariæ, Genistæ, Herbarum, Plantaginis, Plantarum, Quercûs, Tartari, and many others, as each vegetable was considered to afford a peculiar salt: while, in truth, none of them differ essentially from each other, the only variation being in their relative degrees of impurity; so that the terms Sal vegetabilis, or Sal plantarum vel herbarum, would conveniently include the whole. And yet, even now, or very lately, as I have been credibly informed, some persons will give a quadruple or quintuple price for Sal absinthii, an impure subcarbonate of potash, obtained from wormwood, to what they will for the same, but more pure and valuable drug, derived from common and less costly sources.

This is but a solitary example, yet it may serve to illustrate the whole.

Shall I add a further illustration, *oxalic acid*, if procured alone from the plants whence sprang its name, (Oxalis acetosella, corniculata, &c.) would be a very expensive drug: even when at first, under the appellation *Acidum sacchari*, it was formed by the destruction of sugar, it was, within my recollection, sold in this town at 3s. 6d. and 4s. per ounce; but now it may be bought at the manufacturing chemists for about half that sum per pound.

Probably a like fortune awaits many of the proximate principles, in modern times discovered, and still considered to be distinct. Thus, Colchicum is doubtless a useful medicine, though fashion has somewhat enhanced its fame, while Gratiola, the old Gratia Dei, and Veratrum album, or white hellebore, have completely fallen into disuse, if not into disrepute; and yet the active principle is in all the same, and might, if extracted from either, be indifferently used, and with equal advantage and effect. May not this indicate the propriety of extracting veratria from hedge hyssop, or veratrum, where those plants abound, rather than from the expensive colchicum? These instances must likewise indicate the advantages likely to accrue from an intimate acquaintance with the proximate principles of vegetables, when we may find our active agents, not in one situation only, but recognize them in many, and seek them wherever they may be most abundantly present, or most easily be found.

I fear that an accumulation of the evidence of how much is wanted to be known on the points which this Society has proposed as the objects of its chief inquiry, might weary the attention of the meeting. I will, therefore, add but one example more. The value of Peruvian bark is by all acknowledged, and it is likewise known to every one that there are many species of Cinchona, differing in their efficacy and worth. Of these, three are admitted into our London Pharmacopœia; viz. Cinchona lancifolia, or lance-leaved cinchona, affording the pale brown bark; C. oblongifolia, or oblong-leaved cinchona, yielding the red bark; and C. cordifolia, or heart-leaved cinchona, which gives the yellow bark. Now, of these three, it is well known that the lancifolia, or quilled bark, has in general been, by the profession, the most esteemed; still the oblongifolia, or red bark, has not been without its advocates; indeed, popularly, it was so highly prized that, in the markets, it would occasionally fetch threefold the price of brown, and six times as much as the yellow, or heart-leaved species, which was comparatively slighted both by the profession and the public. Perhaps, the scarcity of the red bark contributed something to its high estimation, as the relative abundance of the yellow not improbably increased its disfavor, just as at the present day no one will use, (indeed, who would condescend to use,) the indigenous simple, aromatic, and astringent bitters, Menyanthes, Teucrium, Salix, Acorus, and Bistorta, which grow abundantly at Hampstead, Highgate, Battersea, and Paddington, when they can have Quassia, Catechu, Cinchona, and Colomba, by sending to Hindoostan, Jamaica, Mozambique, or Peru?

And here (as in a parenthesis) I would observe, that our native medicinal herbs have of late been too much neglected; for certain it is that we compass half the globe to import a drug, the prototype of which not unfrequently solicits our hands at home. I, for one, can never think that all those plants are useless that we use not; that such countless myriads of beauteous herbs which "spring profusely wild over all the deep green earth," spring oft in vain, because in vain they court man's notice and regard; I never can believe that Providence has armed the weeds of foreign lands with powers necessary for us, whilst ours are impotent to heal. I never can believe our herbs inert, whilst every plant in other climes may boast itself a physician's staff. I am fully sensible of the advantages of labour, and have often dwelt on the blessings, on the peculiar privileges, those men enjoy who by their station are compelled to work. Yes, I know that it is by a merciful dispensation that man has been condemned in the sweat of his brow to eat his bread; I feel that, where necessity compels not to exertions, indolence debases man almost to the level of a brute; and likewise, I confess that, where most is required for the body, there most fully are developed the energies of the mind; still I cannot but perceive that many of our native plants want but to grow upon the Andes or the Alps to be sought with avidity, and treated with respect.

It is therefore a matter of no mean importance to which, by a resolution of the council, the attention of the scientific world at large, of the members of this Society in general, and of my colleagues and myself in particular, is directed, by the determination to award the silver medal of the present year to the author of the best essay on the nature and uses of any indigenous plants the medicinal powers and properties of which have been hitherto unknown, or only imperfectly recorded. To me it appears that this will be sinking a shaft in a very rich mine of scientific discovery, of truly philosophical research. I doubt not, that we shall find many of the remedies now sought from the tropics and the poles growing at our doors, and soliciting to be allowed to relieve our ills. It is an amiable idea, and one that experience goes far to verify, that wherever natural circumstances favor the production of disease, Nature, i. e. nature's God, hath beneficently conjoined the means of cure. May not the late experiments with Salicine be given as an apposite illustration? For, although we have so long been ploughing the Atlantic, and burdening the bosom of the deep, to bring home our harvests of Peruvian ague-cure, the ever valuable cinchona, *Salicine,* extracted from our native willows, so far as experiments as yet have gone, is proved to be equally efficient with the *Quinine* of Peruvian bark. Where do agues most commonly prevail? Where do we find remittent and intermittent fevers of the greatest frequency and most fatal severity? Where, but in wet low lands; in marshy and in fenny districts. And where do willows love to dwell? Where, but in those very fens and marshes; as if designed to relieve the diseases inseparable therefrom. Hence I cannot but regard them as the living elaboratories of nature, thus planted by Providence to form Salicine for the use of man.

Of the energies of our native plants the herbalists of a former age were doubtless too easily persuaded; their experience could have scarcely justified the encomiums they lavished upon many; at least, our observations will not permit us to corroborate their praises: but, however ready we may be to allow (and no one is more ready than myself,) that the curative powers of many plants have been greatly exaggerated, and that ignorance and superstition have attributed effects to other things than causes, and have often thus ascribed to various vegetables, virtues which they have not, and never had; still I can hardly think that all their asseverations should be based in error; even the greatest lies are generally founded on some little truth; indeed, without it, they scarcely could be framed. And when we consider how truly significant are the common names of plants, such as woodbine, cleavers, sea-thongs, catch-fly, rest-harrow, choke-pear, and many others; when we reflect how justly descriptive is our native nomenclature of many of the properties of the plants to which the rustic names belong, such as bitter-sweet, hedge-mustard, water-pepper, fool's-parsley, hen-bane, dog-bane, flea-bane, cow-bane, bug-bane, fish-bane, bane-berries, bane-wort, deadly nightshade, and so on, shall we precipitately conclude that the malevolent terms alone are akin to truth, and that balm, and eye-bright, thyme or strength, worm-wood, tetter-wort and quinsy-wort, scurvy-grass, fever-fuge, and a multitude of others, are all unmeaning appellations, because forsooth the ancient cure-all, all-heal, all-good, long-life, and live-for-ever, seem, when misunderstood, somewhat hyperbolical expressions.

"Sell your coat," says the Italian proverb, "and buy betony:" wherefore should this plant have been formerly so much esteemed? So little is it now regarded, that we might almost say it is despised. This question, however, will not come alone: for the same may be pertinently asked of our dysentery, uvula, and tooth-worts, of our mad-worts, liver-worts, and gout-worts. But, even granting that some, or many, or even all, our health-promising plants, have no right to their appellations, i. e. exhibit no sensible properties when taken, (which, however, I am far from presupposing,) will it be no advance in knowledge to ascertain the fact of their inefficiency? Will it not avail us much to know that such and such plants do *not* possess either medicinal or poisonous powers, instead of continuing in unenviable doubt? for such as are unfit for physic will afford harmless, and often most nutritious food. Hence I am far, very far, from underrating such negative knowledge; and I am sure I am as far from overvaluing its importance, when I state that, in the treasury of science, it becomes positive information: just as in that language which lives alone to learning and seems to science sacred, two negatives have an affirmative, or, according to their relative situation, more than an affirmative meaning. For example, *non-nihil* and *non-nunquam* simply reverse their separate import, and may be translated *somewhat* and *sometimes*, while *nihil-non* means *every thing*, and *nunquam non* means *always*. So, as is symbolized in this apposite illustration, negations in experimental researches, when duly appreciated and properly employed, become most important positive affirmations.

But to return to the point whence this episode sprang, and to the path whence a favorite topic has so long seduced us. There are several circumstances connected with the history of quinia and cinchonia, the proximate principles of the Peruvian barks, to which, might I so far presume, I could much wish to invite the attention of my colleagues, the learned professors of Materia Medica and Chemistry; for to my mind they require much further elucidation, and many experiments seem wanting to ascertain correctly the properties of these barks, and the principles they respectively afford. The quilled or pale-brown bark was a few years since so much more highly prized than the yellow, that it was sold for sixteen shillings a pound, whilst the other would scarcely fetch a crown; and yet quinia, now so much esteemed, and believed to be the potent principle of the Peruvian barks, is abundant in the yellow, and all but absent from the quilled. Indeed, I am informed by my friend, Mr. HENNELL, of Apothecaries' Hall, one of the most indefatigable and intelligent pharmaceutic chemists of the day, that if the specimens submitted to analysis be correctly sorted, (for, in commerce, they are generally met with mixed,) no quinia at all will be found in the quilled bark, but abundance of cinchonia; while, in the yellow bark, the quinia is abundant, and the cinchonia wanting.

Now this is a result which could not, *a priori*, have been conceived: for it is the *quinia* which is now extolled for its extraordinary curative effects; which principle, be it noted, is absent, or all but absent, from the quilled bark, so lately prized for similar powers; while the *cinchonia*, which abounds therein, is disesteemed: and, on the other hand, as a counterpart to this paradox, *the yellow* bark, so long neglected, yields abundantly, almost exclusively *quinia*, the present fashionable tonic, whilst it contains none or very little of that other principle *cinchonia*, to which all the former cures of its compeer, the lance-leaved bark, must be attributed; it being, as already stated, in an equal degree devoid of quinia.

In the *red* bark both *cinchonia* and *quinia* are found, but in much smaller relative proportions. It is likewise a circumstance worthy notice, that some of the other species of cinchona, specimens of the bark of which occasionally reach us, are said to afford these principles more abundantly than any of the officinal ones; and it is also probable, as shewn by Dr. HANCOCK, that other genera may be more advantageously used as febrifuges than cinchona.

Now, from these premises, we cannot avoid the conclusion that further experiments and investigations, both botanical, chemical, and medical, are much required: for if the quilled bark really did cure ague, and of this there can be no doubt, and if in it there is little or no *quinia*, but *cinchonia* is present in abundance, either its native quinia must be converted into cinchonia, or the neglect with which cinchonia is treated can scarcely be its due. Again, the merits of quinia may perhaps have been too much extolled; or it is not impossible that the red bark, which contains the two principles in question, or a preparation or formula comprising both quinia and cinchonia, whencesoever extracted, may be found the most efficient mode of administering relief in ague.

But these are problems requiring much attentive consideration; and experience must prove whether the former confidence in quilled bark, or the present trust in quinia, be most correct. Probably cinchonia is esteemed too lightly; it demands a series of experiments to ascertain its medicinal effects. This is, however, but one of many points equally requiring investigation, and which must be more fully entered on hereafter; and it is only at this present glanced at, to show how much and in how many ways the exertions of our Society are wanted; how much and in how many ways its members can benefit the world at large. For it is not improbable that many of these proximate principles, now considered as different and distinct, may be hereafter found to be similar in effects, if not absolutely the same in constitution, just as all the old salts of plants, viz. of wormwood, centuary, broom, and others, have been proved to be one and the same, viz. subcarbonate of potash.

The extraction of the proximate principles of plants, of those especially on which their peculiar properties depend, is doubtless a triumphant step in Phytochymics, or Vegetable Chemistry, and is another point to which I must briefly draw your attention; as it is a discovery which promises to open a new era in science, and to work a complete revolution in the armoury of physic. To the superficial observer it may seem that these discoveries, though undoubtedly of very modern date, had been long obscurely adumbrated, as it had for years been known that the stimulating powers of many plants, as of the Cruciferæ, for example, were destroyed by simple exsiccation; that the poisonous principles of Mercurialis perennis might be extracted by boiling in water, when it becomes a palatable and harmless esculent; that the virulent qualities of the Cassava are separated by heat, and that, after roasting, it is esteemed an admirable and nutritious food. This knowledge, however, differed widely from that which has enabled us to reduce and exhibit, in a constant and determined form, quinia and cinchonia as the active and proximate principles of bark; salicine from willows; veratria from colchicum and white hellebore; morphia, narcotine, and meconic acid from opium; and so forth. Great caution, almost a jealous caution, is, nevertheless, required in watching both the extraction of these principles and the records of their effects: for it is not impossible, nay, it is far from being improbable, that some of these substances are products rather than educts of the chemist's operations; just as sugar may be produced from rags, tan from saw-dust, vinegar from wood, oxalic acid from offal, and so on. Not that the mere fact of such transmutations would render the substances produced a whit less valuable than if they were educed; their value must depend upon their intrinsic worth; and it may be far more advantageous, under certain circumstances, to resort to the crucible of the chemist, than to the laboratory of nature, for many of them. We know that wood consists elementarily of charcoal and water; that starch, and gum, and sugar, are similar in their elements likewise: and that they only differ from each other in their relative definite proportions: we know that nature, by varying the atomic ratios of these few simple elements, changes, as in the ripening of fruit, tasteless lignin into powerful acids, which in their turn become converted into sugar, often impregnated with peculiar essential aromatic oils; and thus, in plants, her living retorts, Nature, from watery sap and atmospheric air, so modifies the union of three simple bodies, as to form gum, sugar, starch, lignin, resins, oils, acids, alkalies, and alkaloids, with numerous other proximate principles in abundance, of every kind and in every variety; and this by merely varying the relative properties of the same simple constituents, oxygen, hydrogen, and carbon,—these three, for others are seldom and sparingly employed. We also know that in some instances our laboratories can imitate the vegetable alembics, or render their processes subservient to our designs. Thus, in malting barley, germination is suddenly checked when the starch of the grain has become converted into sugar; and by heat the same starch can be transmuted into gum. It is, therefore, not impossible that many of the more active vegetable principles may be in like manner formed, the more scarce from the more abundant. That some of the newly discovered bodies, at present, for convenience, called proximate vegetable principles, such as caffein, asparagine, piperine, and so on, are not *educts*, but *products*, is more than probable, when we find that they do not exhibit the specific effects peculiar to the substances from which they are obtained. Thus we learn from Mr. BRANDE, that coffee is narcotic, but caffein, as that celebrated chemist proved by experiment on his own person, has (at least in scruple doses,) no sensible narcotic powers; and the effects of morphia bear no proportion to the effects producible by the quantity of opium consumed in its formation. Again, asparagine does not communicate to urine the peculiar odour which asparagus is invariably found to do; and, furthermore, piperine, the so-called proximate principle of pepper, is entirely destitute of pungency and heat. These, then, and many others, will probably be hereafter shown to be products of the chemist's operations; just as beer and wine are not, as they are often called, the juice of barley and the grape, but are produced, not educed therefrom, by fermentation; and alcohol, including brandy and spirit of every kind, is not educed, but produced from wine and sweetwort by distillation, or formed by condensing the vapours which rise from bread while baking.

It may be, then, (and I repeat it for the sake of the impression which a repeated proposition is designed to make,) it may be found hereafter more profitable to form many of these substances now known as the proximate principles of vegetables, directly from their elements, or indirectly from the mutation of common and abundant matters in the laboratory of the chemist, than to procure them intermediately from plants, the living elaboratories of nature; just as oxalic acid can be made from hair, gristle, and such like refuse matters; or produced by the distillation of sugar with nitric acid, instead of being educed from the Oxalis acetosella, corniculata, &c., where it naturally exists; or as prussic acid is now obtained from prussian blue, which can be made from almost any offal, at an amazing diminution of expense to what it could be educed from bitter almonds, cherry-laurel leaves, plum and peach kernels, &c. where the acid naturally exists, and which were once esteemed its only sources. Indeed, one great object of the vegetable world would seem to be, to anticipate the arts, and to provide numerous comforts and conveniences, such as clothes and shelter, nutritious food, and efficient medicines, for man, long before he was able to provide any for himself; and not for man only, but for the whole animal creation. Of this vegetable physiology affords numerous interesting illustrations: and although at present we contemplate the processes of nature but as through a glass, darkly; although we see but in part, and know but in part, still thus far we can perceive that, whether we sleep or whether we wake, whether we rest, or whether we toil, these indefatigable servants are labouring for our advantage; that they are ever actively preparing and purveying sugar, starch, gluten, gum, cotton, wood, flax, hemp, and many other substances, with an alacrity, a perseverance, and a certainty which would be truly astonishing, were we not surrounded by such natural miracles, and did we not live in a world of wonders. Many of these works will doubtless ever remain inimitable by human art; to bounteous nature we must ever be indebted for her most precious gifts. We never can hope to penetrate the arcana of all her mysteries, although in some few particulars we can trace her course, and imitate her productions. Still, as we have already much lightened human labour by the substitution of brute strength, and superseded the use of many brutes by the adaptation of machinery, thus reclaiming much soil from the pasturage of cattle for the growth of food for man, and, by the introduction of steam and rail-roads, we shall reclaim much more; so it is not improbable that much of the labour of tilling the ground for the growth of human food may hereafter be avoided, by the immediate production of many substances from their elements, instead of deriving them intermediately through the culture of plants; or, at any rate, it is not improbable that we may so far advance in science and in art as to be enabled to convert the less into the more useful; the more into the less abundant: as wood into starch, worn-out flax, i. e. old linen, into sugar, and so on; and thus, if it were not for placing an important subject in rather a ludicrous point of view, we (in like manner as spiders and some other insects are said to devour their exuvial skins,) might hope to be enabled, after having worn out our clothes, to feed upon them, and to dine off as well as on our tables.

There is but one topic more with which at present I will intrude on your attention, but it is one which, as it most especially relates to the duties of the professor of botany, I should be inexcusable to let pass unnoticed.

Much of the obscurity attendant on the history of the effects of drugs is doubtless attributable to the careless manner in which plants have too commonly been collected and preserved, but often, still more to the errors which the ignorant and the frauds which the unprincipled commit. Hence, it is necessary that a continual check should be kept by the eye of science over the gatherers and venders of medicinal herbs. How often do we find briony root substituted for calomba, mullein leaves for foxglove, horn-beam for hops, marigold petals for saffron, cow parsley for hemlock, &c. Into one of our largest drug factories there once was brought a large quantity of Œnanthe crocata, which, had not a botanic eye been casually cast upon the heap, would have been both sold and bought for conium; and had an extract, or tincture, or powder of its leaves been used, how disastrous might have been the result. This is not a solitary instance; such mistakes are unfortunately still too common: but henceforth they can less easily escape detection, since a knowledge of botany has been made a necessarily integral part of every medical education. Indeed, much as we may value the labours and researches of the physician and the chemist who investigate the medicinal properties and constituent principles of plants, the labours of both would be often of no avail, did not the botanist aid them in determining, by constant and decided characters, the very plants in which such principles are found, and to which such properties belong; as well as in what situation and under what circumstances they should grow, at what seasons and in what states they should be collected; for all these will often much affect their potency and value: e. g. how different is the Apium graveolens growing in the light to the same plant when excluded from its access? how importantly does a wet or a dry situation affect the character of many umbelliferous plants; for the dry soil which increases the aromatic properties of some, diminishes the essential powers of others, while the wet situations which impair the aroma of these, enable those to eliminate to the full their active poisons. Again: many plants similar or nearly so, and which are frequently undistinguishable to a non-botanic eye, often possess very different properties: thus, to take only the most common and familiar cases, how important it is to distinguish Æthusa Cynapium from the true culinary parsley, the Lolium temulentum from other grasses, and so forth. Thus, how vainly should we seek in Cichorium Intybus for the hepatic influence of Leontodon Taraxacum; and yet, to superficial observers, so similar in their early states are these two very distinct plants, that they are being continually and constantly mistaken for each other; in fact, they form the pons asinorum of all inceptor candidates for botanic fame.

But I feel that it would be here a work of supererogation to illustrate more fully the utter practical inutility of many of the researches of the physician and the chemist, without the botanist would labour with them. What avails it that the physician knows that opium brings sleep, lulls pain, and stays the approach of many ills; that Peruvian bark cures ague; that jalap and scammony are drastic, and rhubarb a tonic astringent purge? What avails it that the chemist by analysis can prove that the sedative principle of opium is morphia, the tonic of cinchona, quinine; or what avails it that he proclaims the equally important facts, that certain specimens of bark submitted to his examination contain a large, and others a small, portion of one or other of the active or inert principles, without the botanist could indicate the plants which yield them, and teach to distinguish those in which the active agents the most abound, and which consequently may be the most profitably employed? Say not that the merchant or the druggist will import and prepare them to his hand: this would indeed be trusting to a rotten staff, without they were themselves instructed in that science which alone can teach to distinguish those which are found less from those which are found more efficient in their use and productive of the active agents sought. Are crops to be cultivated and cargoes to be imported on chance or bare empirical presumption, and the first notice of error be in the disappointment of the physician at the non-efficacy of his prescription, or in the vain labour of the chemist to extract the essential parts?

Besides the certain diagnoses it affords, there is another advantage of botanical system, especially of the natural system, which, although it is very much perverted and abused, holds, in my mind, a rank of no mean importance: viz. the general rule, sanctioned by experience, that plants possessing the same botanical characters often contain the same chemical principles, and produce the same medicinal effects; not always, indeed seldom, in a similar degree, but most frequently in a graduated scale. The potency being traceable in the various instances from its least to its greatest accumulation, from its lowest to its highest stages of activity. Thus, the Lactuca virosa is highly acrid, while the Lactuca sativa is bland and esculent; the Cucumis sativus an agreeable food, while the Cucumis colocynthis is a powerful medicine; the Vegetable Marrow, Gourds, and Melons, mild and innoxious, while the Momordica Elaterium is so violent in its effects as almost to be esteemed a poison. Again, the Croton Cascarilla is a grateful stomachic, while the Croton Tiglium is a most violent cathartic; the Leopard's bane may be contrasted with the artichoke, and parsley with hemlock; the Solanum dulcamara, nigrum, and tuberosum, bear hurtful berries; while those of the egg-plant and the tomato, when cooked, form a wholesome food; the pea and bean are only flatulent, while the laburnum is a poison. And furthermore, so completely are the latent properties of some plants developed in other individuals of the same species, genera, and orders, while the notorious principles of those are overshadowed or become occult in these, that, did not instances occur in different varieties of the same species, and different species of the same genera, they would seem to form more serious objections to the present distribution of the larger groups than they actually do. Thus, in one group, the Umbelliferæ, are found the venomous Conium, Œnanthe, and Cicuta, the harmless and nutritious Carrot, Parsnep, and Earth-nut, the stinking Galbanum, Opoponax, and Assafœtida, and the grateful aromatics, Cummin, Coriander, Carraway, and Dill. But, then, it should be remembered that, in the same genus, *Œnanthe*, while the roots of the species *Crocata* afford a deadly poison, those of the species *Pimpinelloides* form a wholesome food; and even in the same species, *Apium* graveolens, the cultivated Celery, is a harmless, while, in an uncultivated state, it is a deleterious plant. Once more, the milk-tree and the bread-fruit are associated with the Upas of Java; but the connexion is established between them by the figs; for, although most are harmless, one species of the genus *Ficus*, the Toxicaria, is, as its name imports, an acknowledged poison. Of these illustrations there would be no end, did time allow of the pursuit: on another occasion I may, probably, should it be sanctioned by the Council, bring the matter more at length before the Society, as it is one that requires much serious deliberation.

Vegetable physiognomy (if I may so express myself,) is a study well deserving cultivation; for it is most important to be able, on looking at a plant, to affirm, on principle, this may be eaten; that is a poisonous plant; or, again, those are suspicious vegetables: such knowledge, moreover, is not only desirable to have, but easy to be attained; and its practical utility has already been, in several instances, shown under circumstances of urgent need. It is, however, a skill in vegetable physiology, a knowledge of the laws of vegetable metamorphoses, which can alone enable us to decide such points with safety, and it is one of the most delightful of all botanical praxes to work out the relation of organs apparently, but not really, different, and thus to establish the *hetero-* and *iso-morphous* characters of plants, often improperly associated or severed; and to the rudimentary state of this branch of botany may be attributed those anomalies, those apparent paradoxes, which at present form exceptions to our natural schemes. But even this power of diagnosis may be, nay, it already has been many times perverted; and men, presuming on their wisdom, when they ought rather to avow their ignorance, have supposed their knowledge of these general laws so perfect and complete, that some have not scrupled to declare it *impossible* for nature to swerve from those they have defined, and refused to believe in the possible occurrence of exceptions. Exceptions, and numerous exceptions, do, nevertheless, undoubtedly exist: these should, however, rather stimulate us to review our natural classifications, than to discard them altogether; should lead us rather to distrust our own performance, than to accuse nature for a moment of egregious error.

The true purposes and value of the natural and artificial systems, the aid they reciprocally afford each other, and the mode in which they may be most advantageously employed in the advancement of medico-botanical science, will form another very important topic, which, with the permission of the Council, I purpose submitting to the consideration of the Society. It is one that I consider of paramount importance, and the corelative utility of these two systems is a point for which I have long most ardently contended, and one which I have not neglected to inculcate, both in my lectures at the Royal Institution, and in the medical schools of Great Windmill street and St. George's Hospital: for I am sure that either, when alone, would be a most imperfect guide; while from them in conjunction we derive a clue which will be often found to lead to discoveries of the greatest brilliancy and value. Analogy will lead to experiment, and experiment, guided by analogy, will lead us to truth.

But, to conclude. In the botanical researches of this Society, it is evident that much discretion must be exercised, so as to render complete the medicinal history of the subjects we propose to illustrate, without including in our transactions topics foreign to medico-botanical science. Hence, although your professor of botany is sensible, no one more so, of the interest and importance of anatomical and physiological, as well as systematic and economic botany; and although he would consider himself wanting in his duty to this Society, were he to neglect any of these departments, all which bear, either directly or indirectly, on each other, still he would regard himself as perverting the objects of the Society, and wandering from the designs of its institution, were he to occupy the time of the meetings, or the pages of the Transactions, by any disquisitions on mere anatomical, physiological, or systematic themes. Many of them must, of course, engage his attention, as promising to throw light on medical botany; but whenever individual research has shown them to be impertinent thereto, they cease to be objects fit for presentation here. Their value to science, however, is not the less; at other times, and in other places, if presented, according to their worth so will they be esteemed: and this seems the more necessary to be stated, lest any should precipitately conclude that general botany and medical botany are two different sciences; whereas, the one is but a part of the other, just as the fruit is but a part and production of the tree on which it grows. Hence, it must be evident that there are no means practicable of learning just so much, and so much only, of the philosophy of the vegetable world, as may be immediately applicable to the purposes of medicine, without at the same time studying the science as a whole; and this could alone efficiently be done by making it an independent subject for instruction, and enacting that an attendance on botanical lectures should henceforth become an essential part of every student's duty; for, without such knowledge, no medical education can be truly esteemed complete. The junction of botany to materia medica is absurd, as one must, of necessity, be neglected; for if, in the time allotted to the course, equal attention be paid to both, both will be imperfectly and unsatisfactorily taught. The courses must be kept essentially distinct, even when delivered by the same professor. If, in the infancy of physic, their union was tolerated, and botany studied merely because some plants afforded medicines, such an occultation no longer can be borne. Both sciences, by such a scheme, are injured, and keep each other, as it were, in fetters. They are both sufficiently extensive and important to form separate studies.

The advantages resulting from the division of labour are too well known, and have been too long established, to need illustration here; and our Society, although akin to others, of which it would almost seem an emanation, has objects as important and distinct as those have from their antitypes. Thus, the Royal Society, which at first, and in our infant days of science, included in its fostering arms every department of philosophy, soon gave rise to other associations for the especial advancement of particular sciences: such as the Antiquarian Society, for archæological researches; the Linnæan Society, for the encouragement of natural history, whence the Horticultural, the Agricultural, the Medico-Botanical, and Zoological Societies have sprung. Thus, as science advances, each separate branch, arriving at maturity, quits the parent institution which nurtured it in youth; and hence there has arisen that brilliant galaxy of British associations, of which our country justly boasts, as the Royal Society, the Royal Society of Literature, the Royal Institution, the Medical and Medico-Chirurgical Societies, the Geological, Geographical, Astronomical, and numerous other learned associations, all striving in honourable warfare against indolence and error, all engaged in a glorious crusade to recover the holy land of science from the infidel dominion of ignorance and sloth.

Gentlemen. In attempting to develop what he considers to be the legitimate objects of your Society; in attempting to trace, as it were in outline, what he considers to be the duties of his office, your professor of botany is aware that he has very inefficiently foreshadowed the object he had in view; and yet, insufficient as the sketch avowedly is, he is sensible that, in following it practically out, he shall often have occasion, as at the present moment, to claim your indulgence for much that has been done imperfectly, your pardon for much which has been wholly left undone: and yet he doubts not that, when zeal in your service is apparent, you will kindly, from your own resources, supply that which in him seems wanting.

Your professor of botany is likewise sensible how much he must depend, how much he must be indebted to the cooperation and separate exertions of his colleagues; yet he doubts not that, from their well-known ardour in the pursuit of science, they will always befriend him in completing those accounts of medicinal plants, from time to time to be presented to the Society, and for which duties none can be more competent than themselves: for thus conjointly we may hope to be enabled to collect such ample details, and such certain records, drawn from actual observations and experiments of the principles, properties, and powers of the vegetable materia medica, as may go far towards perfecting the practice of medicine, and rendering, as Homer says,

“A wise physician, skilled our wounds to heal,
More worth than armies to the public weal.”

*'Ιητρὸς γὰρ ἀνηρ πολλῶν ἀντάξιος ἄλλων,*
*'Ιȣ́ς τ' ἐκταμνειν, ἐπι τ' ἤπια φαρμακα πάσσειν'.*

J. AND C. ADLARD, PRINTERS, BARTHOLOMEW CLOSE.